

John Ball

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Introductory Lecture

for 1813

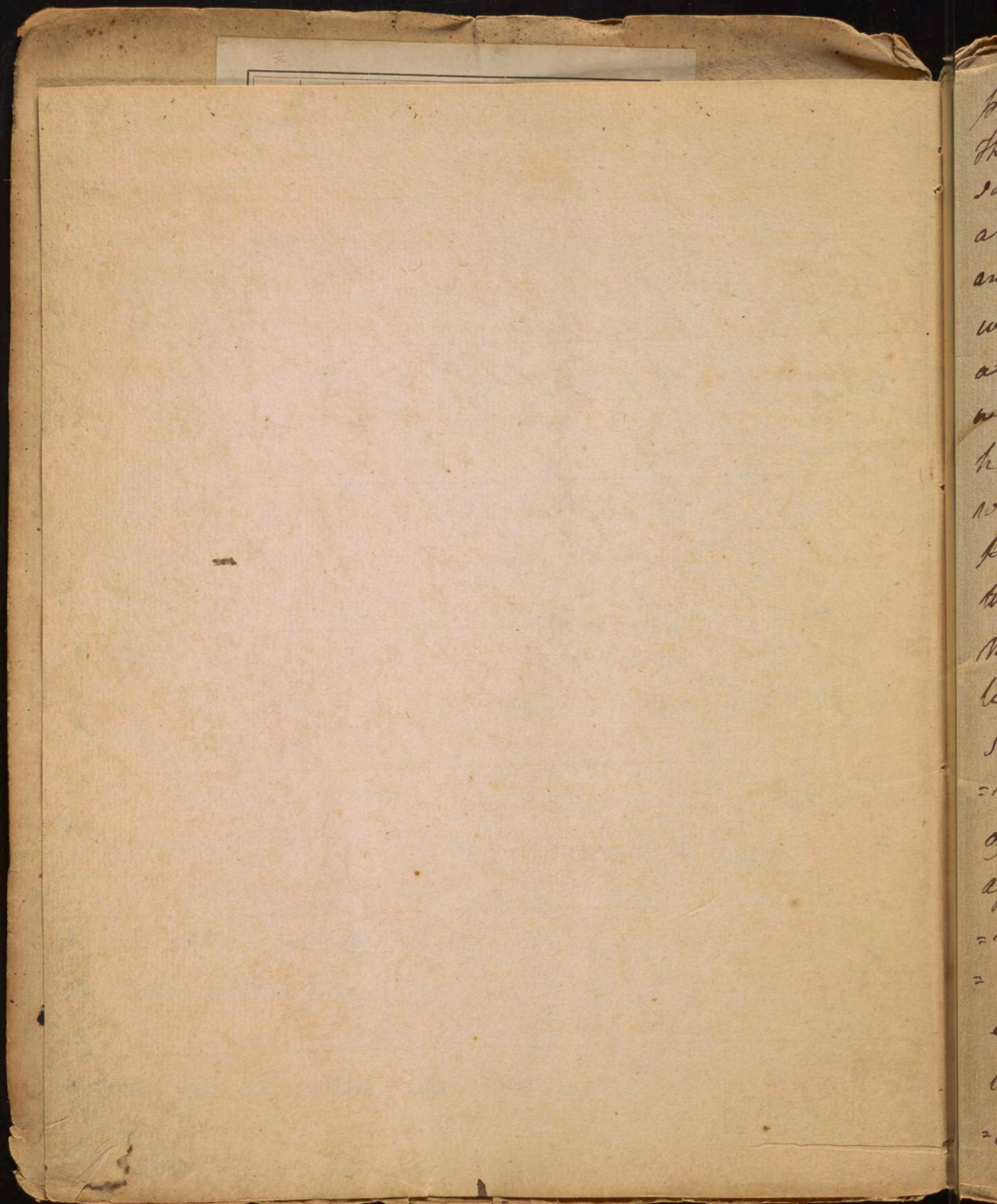
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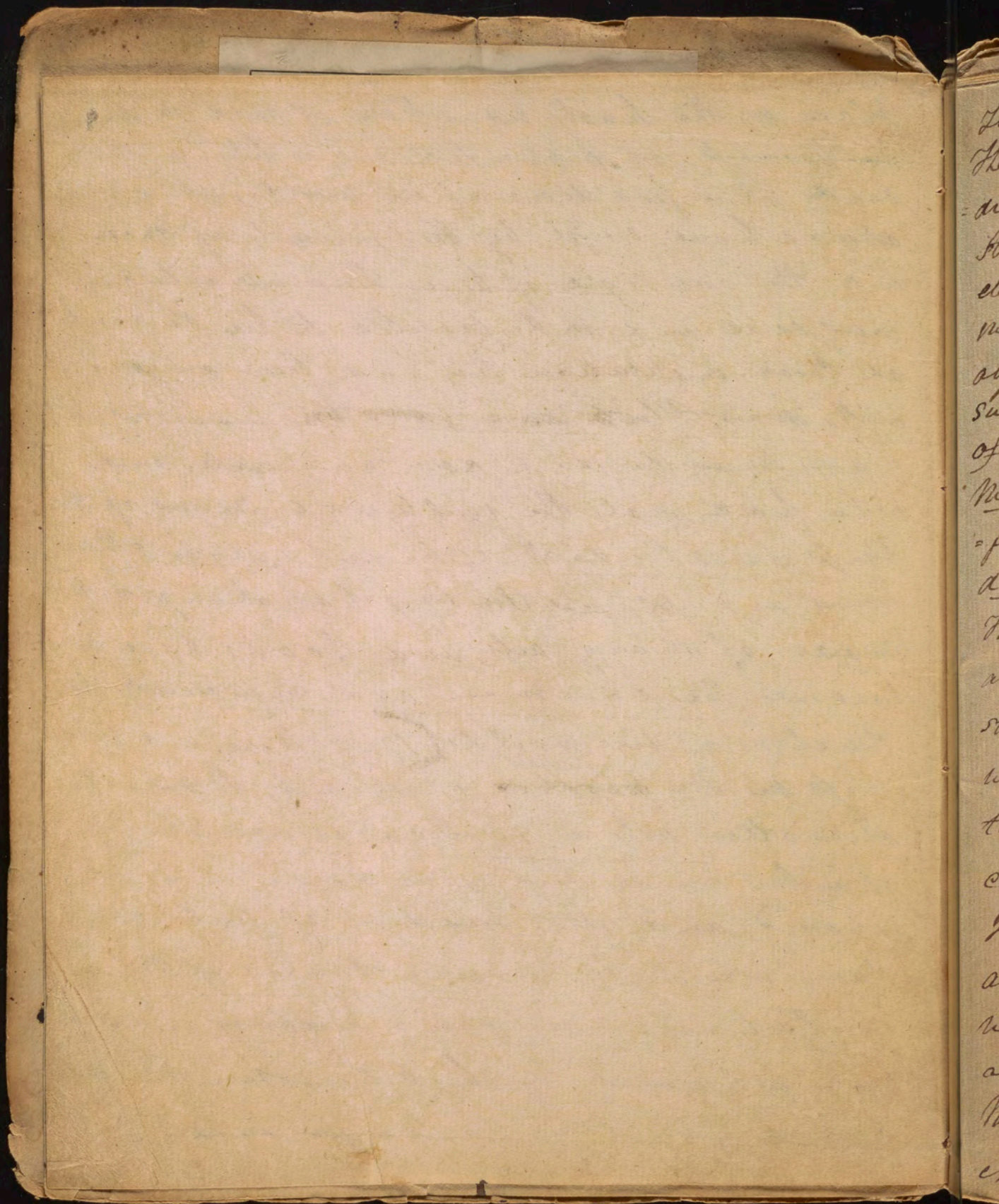
By

James Rush

I have come before you ~~to deliver~~
to deliver an introduction to the lectures of
the late Dr Benjamin Rush, on the Institute
and practice of medicine. In thus address-
ing you I do not feel as if I were perform-
ing a voluntary task, I consider it a duty.
By the favour of the author of these lectures
I have ~~been made~~ ^{become} the possessor of them,
and I should be unworthy of them trust,
if I were not, by an endeavour to extend the
truths they contain, to aim at some slender
imitation of the exertion of him who used
so much industry to originate and teach them.
The present time has been calld with a re-
-stiment of reproach, the age of lectures, In
thus adding to the number I feel disposed to
question the advantages that are said to re-
sult from their mode of instruction, and to
ask if greater benefit might not be derived
from the more deliberate opportunity which
books afford, for receiving knowledge
and reflecting upon it, than can take



place in the hasty transition of oral discourse.
The business of public lectures is like a thousand
and other practices of the world, into which
abuses have crept by the interests of men
and the oversight of time. Their advantage
was real and indispensable to the student
at their institution. They had their origin
with ~~Lecturers~~, ~~Plato~~ and ~~Socrates~~, teachers who
had knowledge to communicate, and
who had not the multiplied means of the
press to extend that knowledge to other
times and places. Printing has changed the
mode of many arts, and books have now
become the common and sufficient in-
structors of the world. [But there is a like-
ness in the ^{affairs} ~~practices~~ of man to those effects
of matter where motion is continued
after the cause that gave rise to it is re-
moved, and the practice of public lec-
tures, which the circumstances of these
early teachers rendered necessary, has
been continued by habit, when the oc-
casion for them no longer exists.



To this remark there are some exceptions.³
The elements of all knowledge must be ad-
dressed to the senses, and among medical
studies there are some branches so absolutely
elementary that ~~an~~^{an} attempt to teach them
in any other way than by exhibiting their
objects to the senses, would be all in vain.
Such branches are Anatomy, the experiments
of Chemistry, the operations of Surgery, and
Materia Medica where it is properly or use-
fully taught, by showing and not merely
describing the sensible qualities of Medicines.
These subjects will be more easily understood
and more impressively conveyed by the demon-
strations of a lecturer, another occasion on
which lectures may be useful is when they con-
tain knowledge or peculiar opinions which
cannot be obtained from any other source -
I need not say with what plea I claim your
attention. The lectures you will hear contain
not only the record of as much experience
as has fallen to the lot of any teacher, but
they contain original deductions from this
experience, and an application of these prin-

v. you may know

v. the art of -

ciples to medical practice, that the opinions it
contained in those lectures are original and
useful I have only to ^{state that} ~~renewed~~ the trial and
conviction of their truth, thro'out a whole country has
overcome as powerful an opposition as was ever
raised against any innovation, and that with
the double operation which many truths have
of offending and convincing, they have by the same
persons been both condemned and practiced. ~

I will employ the present time in stating the
objects of this course, and pointing out the manner
in which those objects may be studied and improved
to the greatest advantage. ~

By the Institute or Institutions of Medicine is meant
the knowledge we have of the phenomena of the human
body in health and in disease, and the effects of re-
medies when applied to it, reduced to general rules
and made preparatory to our entering on the prac-
tice of ^{the art of} ~~the science of~~ Medicine. By the practice of Medicine is meant
the use of these Rules in all the individual cases of
disease to which they can be applied { ~~The Institute~~
and a practice of medicine is no more than that di-
vision which every science admit into a specu-
lative and a practical part. }

The Institute ~~or the preparatory part of Medical~~

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has been subdivided into Physiology, Pathology,⁵
Hygiene and Therapeutics each of which I will
endeavour to explain -

In a healthy human body there are various actions
taking place such as the circulation of the blood,
the motion of the muscles and nerves, the digestion of food, the secretion of saliva, hile and
perspiration, the functions of the mind, and many
others, have the branch that ^{considers} ~~describes~~ the ^{healthy} phenomena
in all these cases and ^{explains their causes} ~~describes their~~ is called
Physiology -

If the human body were to remain always
in the regular exercise of these healthy actions
Physiology would include every thing that could
be known concerning that body, But these ac-
tions are liable to be altered and this altera-
tion constitutes disease - The next step then is
to enquire what may prevent this alteration
from taking place - The branch which ^{considers} ~~describes~~ the means of ^{preventing} ~~preventing~~ these ^{disordered} ~~healthy~~
actions is called Hygiene.

But we often find that all endeavours to
prevent the healthy actions are fruitless, and
disease occurs. ~~It is our aim to cure this, and~~

and the parts they particularly effect -

In order to ~~do~~ ^{cure it}, we must enquire into the ^{or}
causes which have produced the disease, ~~is~~
~~order~~ that they may be removed, the part of
the body it occurs in, that we may know when
to apply the remedy, and the Signs or Symptoms
~~in order~~ that we may know the danger they
indicate, or may choose the remedy for them.
The branch that ~~considers~~ ^{considers} all these particu-
lars of the Causes, Seats, Effects, and Signs
of disease is called Pathology -

When Pathology has thus taught us the
nature of disease our next measure is
to apply the remedy to it. - The branch which
~~considers~~ ^{considers} ~~the manner and degree in~~
which medicines operate on the body so
as to suit them to the circumstances of
disease, is called Therapeutics -

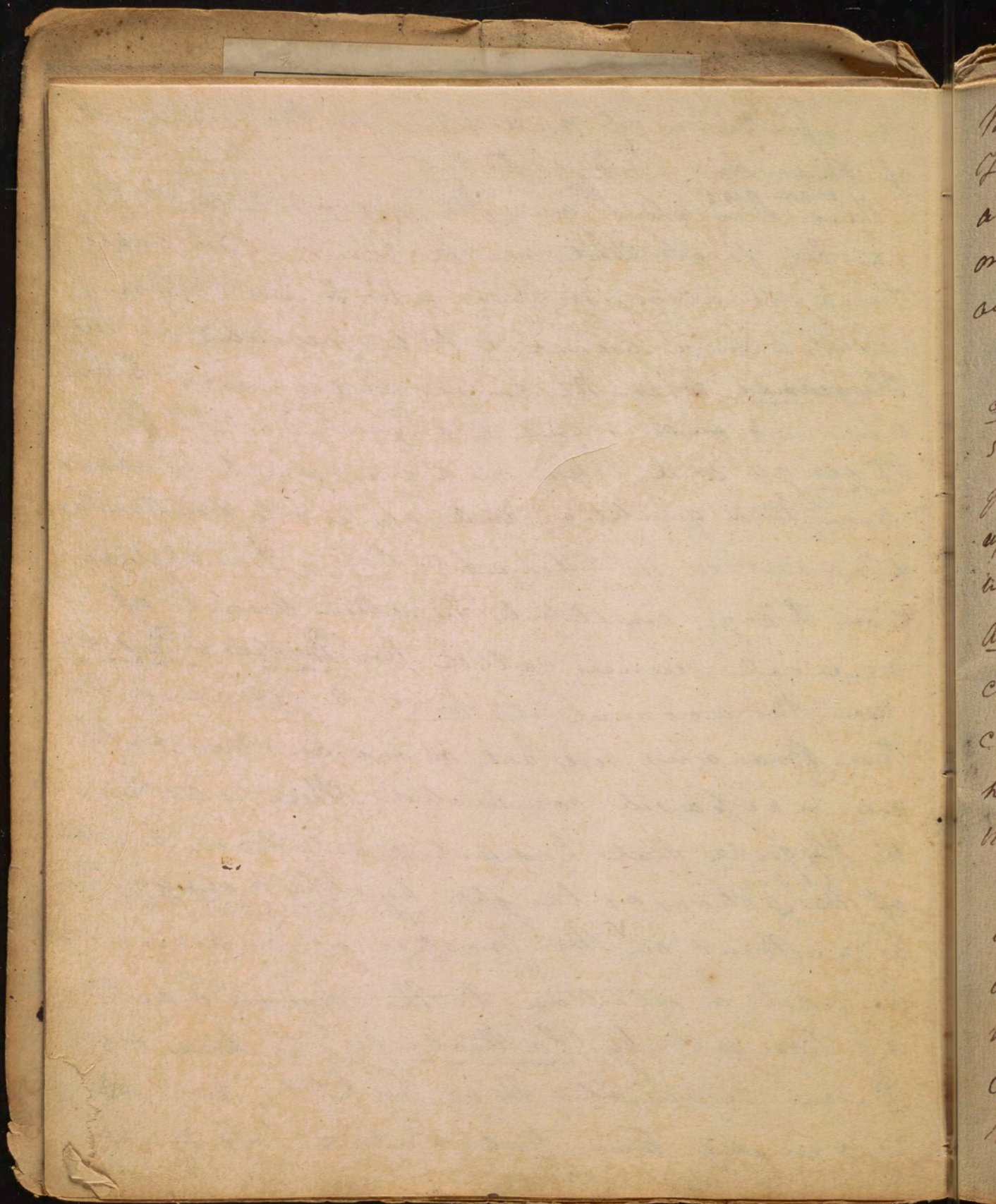
The Institute then consist of these four parts
Physiology or the theory of the healthy
actions of the body - Hygiene or the
theory of the art for preserving these actions
Pathology or the theory of the diseased ac-
tions - and Therapeutics or the theory of

v. of the institutes

v. Therapeutics or

The operations of medicine for the removal
of these diseased actions. —

These ^{various} branches give the general rules only
on the facts that are included under each.
The application of these rules to particular
cases, when a disease is to be prevented as in
Hygiene, when the causes of disease are to be
removed and signs distinguished as in Pa-
thology and when medicines are to be chosen
from their qualities and applied to particular
diseases as in Therapeutics — This applica-
tion I say constitutes the other branch of
medical science called the Practice of Medicine.
From this account it must be obvious that
these branches rise out of one another, and
are necessarily connected. There is nothing
in Hygiene that has not a relation to some
of the ^{natural} actions as taught by Physiology, there
is nothing in ^v the practice of medicine that
has not a relation to the diseased actions
as taught by Pathology. It is true we
have separated them by title, but it
is equally true that nature has made ^{unity}



them dependent on each other in reality.
Taken all together they are an entire System
and as a system they must be taught
on one aban don nature for the sake of
our own unmeaning distinctions. —

These are the objects of the Institute and Practice
of Medicines, and I will presume to point out
several things that are necessary for the ac-
quirement and advancement of our knowledge
upon them. I suppose I am addressing persons
who are desirous to improve a very imperfect
Art, those who will not be contented to re-
ceive the talent from their predecessors, and
carefully wrap it up for their posterity, I
hope their successors will receive it with
interest —

I would just ^{wish} ~~hope~~ that you ^{may be} ~~are~~ con-
vinced the object you are pursuing will be
useful. This is not an impertinent request.
We do know that there are Medical Hypo-
crisies. Physicians who practice and who at
the same time believe in the entire uncertainty

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of the art - That the partiality of other pro⁹
fessions, the peevishness from incurable dis-
eases, and the inventions of wit, should
suggest this idea, we need not wonder, But
the honesty at least of a physician should
~~prevent~~ repress it, if his knowledge could not
prevent it from arising - Where this idea ex-
ists let us never attempt to refute it, since it
is held like all sectarian opinion in ob-
stinacy and pride, and since a physician
can have no interest in refuting that opinion
which the fear of death will always de-
stroy -

In the subject I propose to teach you will
find that inconvenience which is felt in the
acquisition of all knowledge except the
~~Mathematical~~ ^{of giving} sciences of Quantity ~~and number~~, I mean the
difficulty ^{of giving} a system of instruction purely ele-
mentary, and rising by demonstrated and
successive truths, till the whole has one
face of complete perspicuity. The labour
of the mind has its waste and its useless
remnants, like the labour of the hands in the

v. There is a true comparison
of knowledge to a circle -

10-
act, and this must consist in the necessity in
introduction into the subject we are teaching of
those things which have not been previously
explained. ~~It is no longer shown how we come from~~
~~to a circle~~, we cannot set off from one point
of it, without leaving behind some part
unknown that is connected with what we
are tracing before us - and we are obliged
to remedy the imperfection by going over
the circle again. ~~[The reader can look these~~
~~because we find one part necessary to the~~
~~exceptions of an other]~~ The Intellect and
Practice are not a purely elementary study.
They imply some acquaintance with sub-
jects to which they merely make an allusion.
These subjects are Anatomy Chemistry, the Qual-
ities of Medicines and the prominent symptoms of
diseases - I wish you may have some acquain-
tance with these, they contain the visible signs
that should be known before entering on the
present undertaking. - Every science has its al-
phabet, its syllables and its words, to which
we must be familiarized before that science can

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be a language to us. Anatomy then if I may ¹¹
so speak is the home book of medicine; it is
addressed only to our senses and our memory and
is comprehensible by every one. It must be known,
as it describes those parts of the body at rest which
it is afterwards the business of Physiology to dis-
cuss in motion - Unfortunately for Physiological
inquiry, Anatomy can satisfy very few of its de-
mands - since most of the functions of the body
whose causes we desire to know are the effect
of the action of parts on each other, which
are beyond the power of the senses -

Some knowledge of Chemistry should also pre-
cede our present pursuit - Chemistry exhibits the
effects, ~~of~~ and investigates the causes, of the action
of the minute particles of matter on each other, and
in this view should indeed be ^{the} preliminary of all
Physical science, as it is ^{to} the properties of the
minute particles of matter that the effects of the
world must be ultimately traced. As a part
of material creation the human body then comes
under the investigation of Chemistry and you
know that the opinion has been defended, that

v. That to understand

all the functions of the body are the effect, of ¹²
Chemical affinity alone. The knowledge we possess
does not allow us to decide this difficult ques-
tion. But as the causes of many of the effects in
the human body are manifestly chemical, we
may hope that those causes which still are hidden
may yet be brought to bear a part in the sim-
plicity of nature, by being arranged under the same
head - I say we may hope, since no human
judgement can pronounce the anticipation
unobtainable. However this question may end
it is certain ⁵ the analysis of animal fluids
and solids, secretion, Respiration and the
actions of several medicines ~~are~~ requires a
knowledge of chemical principles -

Materia Medica should be an other article of
your preparatory knowledge. By it I mean
an acquaintance with the ^{sensible qualities} ~~colours, smells, taste~~
~~weight~~ ^{effects and} doses of medicines by an actual
display of them. It is to this short Materia
Medica these lectures will refer. The places
where they grow, their methodical arrangement

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and the person who first discovered and used them, are subject ^{with} which as physicians we have no immediate concern; They come under the view of the geographer the Botanist and the Biographer. I do not say that these ought not to be known, since I believe that nothing which can be heard can be useful. I only ask for it in its proper place. Nature offers confusion enough to our slender intellect let us not second her operation in our pursuit of knowledge, by adding obstructions, where through human means they are avoidable. - There are men of business in mental as well as bodily exertion. The modes in each are analogous. Do only what the end of your business requires and let the means be systematic.

I have said that you should have some knowledge of the symptoms of disease from actual observation. There are many ideas which cannot be conveyed by words. we think we describe them when we tell their resemblances. we may metaphorically describe a pulse by saying it is a tense or soft pulse, or that it is quick or frequent, But

A musical instrument.

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Should any of you be unacquainted with
the subjects to which I have referred, you will
hear them with their full explanations from
the ~~old~~ professors of the University. And I
cannot count it too fortunate, that such
great aid is thus afforded me in those de-
partment, where I ~~should~~ ^{might} be utterly at a
loss to instruct -

It will be necessary then that you know these
things, for the easier acquiescence of what I
will read. When this is heard and heard, you
will have only a sight of that which ought
to be known. To be informed of what is
known in the world is both satisfactory
and useful, but at best it is ~~but~~ ^{only} a ~~second~~
secondary ^{condition} operation of the mind - The
pleasures of learning are delightful, but
they are selfish, the pleasures felt in im-
proving an art are those of the largest
benevolence, for the benefits extend to
all futurity - In learning we receive

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advantages from those who were be-¹⁶
fore us, and when we remain contented with
it we live as if the world were to end with
our lives - The only way to show we feel gra-
-titude to our ancestors, is by aiming to bestow
benefits on our posterity -

~~Let~~ I will suppose then that your greatest
ambition is to add to the knowledge we
already possess - For the accomplishment
of this ambition I will mention some of
the modes of study that appear suited to the
purpose. -

The first employment, for the improvement
of medicine, is that which has improved every
science, the exercise of an attentive and enlight-
-ened observation - By an enlightened observa-
tion I mean one distinguished from that
common notice of things which sees them
only as individuals, and not as parts
connected into one general system, whose
operations it is the business of Science to

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understand and to describe - The faculties¹⁷
for this mere notice of things are the senses
only and are possessed by all mankind, But
these faculties never accomplished any thing
in Science - We are often told of the observa-
tion of the vulgar and this observation is
set against the speculations of the wise.
But ~~it is~~ ^{may start he} ~~is~~ asserted that vulgar
observation is often defective than learned
speculation - whence come the multitude of
superstitions in Religion? whence come the
falsities of the causes of things that are
current ~~in the~~ among the ignorant? whence
come the blunders in the mechanic arts, where
one man of enlightened observation will
rectify what has been practiced and passed
over by thousands? These are the fruits of
vulgar observation - If by observation
is meant the mere beholding of things by them-
selves, then the brutes are our equals, who -

v. Let us suppose you wished to observe
the mechanism of a watch, in order
to understand the causes and effects
of its motion

philosophic 18
know a tree from a stone. The observation
that has improved the world is of a
different nature. ~~with that degree of exactness~~
~~which has been achieved only with~~
~~practice and study~~ - Observation is considered
as a simple act of the senses, but it is more
complicated, ~~it does not~~ ^{Besides} our perception it employs
our memory, association and judgement, ~~it~~
~~will illustrate this by the association of the~~
~~members of a body~~ - ^{You} first perceive the
bowl or that part which contains the spring,
and note all its appearances, ~~retaining~~ ^{retaining} these
in ~~my~~ ^{the} memory, and proceeding to the screw
or part on which the chain is ~~wound~~ ^{set}, ~~note~~ ^{you}
its appearances. From an association of the
ideas furnished by each of these parts, and
a comparison of their relations, ~~you~~ ^{you} conclude
that one cannot move without propelling
the other in a manner corresponding to the
connection between them. In this manner

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by a successive act of perception memory
association and judgement, ~~it~~^{you} pass over
the whole structure, and obtain at one view
a knowledge of the ~~whole~~ entire connection
of the machine - now this ~~is~~^{has been} obtained by
what is call'd merely an act of observation.
But it must be manifest to you that the
process of the mind is the same as that em-
ployed for the attainment of the sciences
as we observe the watch, we must observe
nature if we wish to discover her causes
or modes of operating. There is but this
difference between them, the observation of
the watch is conducted on one insulated
spot, in a short time, without the interference
of other mechanisms to mislead or distract
us - The observation of nature, is conducted
in different places ~~and~~ under different cir-
cumstances, at distant periods of time, and
with the interposing of many irrelevant

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circumstances to weaken our attention. ²⁰
The mode is the same in each case, only
the observation of nature requires the
greater act of memory, the stronger act
of association, and a clearer judgement.
An effective observation consists not only in an
accurate attention to the things that pass be-
fore us, but also in an attention to many things
at the same time, or if that be impracticable
thru' the limitation of our minds, to a number
of things in such rapid succession, that the
whole view appears as instantaneous, as if it
were done at one time. It is by this collection
view that we gain a knowledge of the opera-
tions of nature, or in other words, of the
causes of things. If we see the parts of a
complicated machine in separation or
slow succession, it is impossible to compre-
hend it, But if it be arranged before

v. These remarks will receive exemplification or proof, from an attention to some of the departments of our knowledge. The certainty of the sciences of arithmetic and geometry, is derived from all the circumstances that lead to the truth of their calculations or measurements, being at the moment of conclusion within the scope of the senses or memory whereas other subjects which do not admit of this advantage

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us so that all its parts are exhibited at
once it is easily understood. The same is
true of the works of nature which are the
operations of a great and complicated
machines, By studying them separately, they
may be known as individuals, but we can
not tell how they effect each other, It is by
bringing the parts together by a comprehen-
sive observation, that we are able to dis-
cover their causes. ^{v.} This idea will be ^{further} elu-
cidated by what I would observe with re-
ference. The Deity by the perception of infinite
senses perceives every thing. Sound, motion
and form cannot be so infinitely diminished
that his senses by a parallel infinity can
not overtake them. But knowledge from
these sources alone, would not be omni-
potence, there is in ^{him} ~~no more~~ a power to see
all things at once, I would call

of having all their facts brought at
once within the field of observation
are still perplexed with error or ob-
scurity. How many vain theories of
the Tides prevailed, before an obser-
vation of the phenomena of the waters
in all parts of the earth established
our present system on that subject
What a mite of medical truth
is mix'd with its mass of error
and uncertainty, from the impos-
sibility of obtaining at one view
the whole of the functions of the
human body in health and disease
The uncertainty of predictions
in meteorology flows from

This attribute the greatest if it did not ²²
rank among perfections, since in man
the faint ^{earthly} image of the Deity it is the strongest
characteristic of mental distinction. It is ^{perhaps} ~~the~~
^{one of the} secrets of the genius of Shakespear and Bacon.
They never saw things by themselves. - This attribute
of acivity is the fountain of his omnipotence, by
placing at one view before him all the operations
of creation; and man in a humble likeness, gains
a knowledge and consequently a power ~~and~~ in
the little sphere he studies, by an observation that
cranes into one view, a number of the parts
of which that sphere is composed. - The labours
of genius are a constant endeavour to approach
towards ~~the perfection of this aggregating faculty~~ ~~from~~ the perfec-
tion of this aggregating faculty. It will how-
ever never be reached by man, from the ab-
solute necessity he is under of considering
things in succession. One use of his memory

the limitation of our observation of
the phenomena of the weather to
a few places, ~~and in these places~~
~~from the~~ and from the observation of
the phenomena ~~of these places~~ being
made in these places, in successive
years more than by comparing the
observations with the effects that
are occurring at the same moment
on all the other parts of the earth
but records of these successive
observations have been accumu-
lated by naturalists, without
advancing their knowledge
much beyond that of an or-
dinary and unphilosophical observer.

is as a substitute for this faculty. It ²³
brings before his eye whilst viewing one
object those he has seen before, and thus
gives the faculty of ~~seeing~~ beholding many
things at once, which in the daily is a
single act of perception - The more nu-
merous the objects are that are thus brought
up by the memory and the more intimately
they are related the ~~more~~ greater will
be the power ~~of~~ to discover the opera-
tions and causes of nature -

It is observation conducted on these
principles which must improve our act.
First to see precisely all the individuals
that come before us, and secondly to cul-
tivate the habit of collecting into one
view the greatest number of these in-
dividuals.

If a number of men such as
Sausure were stationed ^{at the same time} over the
earth to mark the courses and
nature of the winds and clouds
more truth and practical predic-
tion would be obtained from the
comparison of their simultaneous
observations than could result
from the strictest diary kept by
any one of them through suc-
cessive years to the end of time —

To derive benefit from this observation²⁴
we must be diligent in the use of it.
To stand and note only the things that pass
by, will limit our knowledge to a few and
accidental objects. The metaphor applied to
the means of acquiring science is walks
Its seats are only those places where a long
^{time} of industrious travellers has deposited
^{its} ~~their~~ collections. The common consent of
mankind makes gain in all its objects
the result of an ^{steady and} industrious pursuit
of it, Shall the man mark whole hills
of clay ^{and sand to obtain} ~~to find~~ one little diamond point?
and shall not they who desire the truths
of science, give from their higher im-
portance, a greater degree of attention
and industry for their acquirement.
Shall they above any that which

v. a case of illustration will show
that it is little more than the
philosophic observation, considered
under the last head. —

is the price of every thing worth ²⁵
papering Labour. - That mind
will be a meagre one that is fed like
the animals, fix'd to the rock which
passively receive their nourishment, by
the flowing of the tide upon them, the
mind that would be active and vigorous,
must be nourished like the Eagle, by
a restless and a piercing search. -

The proper employment of our reason-
ing faculty - is an other mean for our ad-
vancement in the study and improvement
of medicine. From what I have said un-
der the last head of observation you must
perceive that it includes the act of rea-
soning. Reasoning ^{consists in marshaling our thoughts} is the ~~statement of facts~~
and the ~~deciding~~ ^{deciding} upon their agreement or
difference. ~~Smile states are the~~
~~negate it is little more than observation~~

First it was a truth established by observation that the symptoms of inflammatory fever were, a tense pulse, a dry skin, thirst, a diminution of many secretions and occasionally an effusion of fluid on the surface of the skin in the form of perspiration - it was known too that inflammatory action in the blood vessels sometimes produced fluids below the skin as in burns and scarlet fever. - It was further observed that this inflammatory fever was relieved by depleting remedies. - Now it was also observed that many dropsical patients, had this same tense pulse, dry skin, thirst, and diminution of many secretions, it was further seen that there was an extensive effusion of fluid below the skin of the limbs, and on the surface of the

Let us suppose that reasoning ~~led~~ ^{led} ²⁶
to the use of depleting remedies in Dropsy.
~~This is the proof. First it was a truth~~
~~established that inflammatory fevers requi~~
~~red depletion. Now observation of a dropical~~
~~patient, showed that there was a ^{many} pulse,~~
~~a dry skin, thirst and a diminution of many~~
~~secretions. It was further observed that a~~
~~secretion of fluids was the result of some~~
~~inflammatory action, as we know and see~~
~~it fever. It was known too that many~~
~~inflammatory fevers terminated in the~~
~~effusion of water on the skin in sweating~~
~~and thro' other excretories, and the fluid~~
~~found in dropsy was an effusion of water~~
~~into the cellular membrane and on internal~~
~~concretions. and was no more if I may be~~
~~allowed the name than an internal~~
~~peripneumony. Now all these phenomena of~~
Dropsy being observed, they were compared

~~surface of the~~ cavities of the body -
constituting in these cavities, if I might
so speak a kind of internal perspiration.

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with the phenomena of inflammatory fever.
and the coincidence being so extensive, it
was presumed that the agreement was uni-
versal, and that the state of the system
would also resemble each other in the effects
produced by one remedy upon them. The
Apleton therefore which had been found
beneficial in inflammatory fever, was
used for dropsy, and the result was a cure
of the disease. Now this conclusion was an
act of reasoning, but you see how much
of the process, by which the truth was at-
tained was a mere observation of the visi-
ble phenomena of the cases. The reason-
ing ~~by~~ here illustrated is by analogy, or from
a resemblance in most particulars of two
objects inferring a resemblance in all, and
it is the only ~~instrument~~ ^{made} of reasoning
we have for the acquisition ^{of the greater part} of medical
truth, ^{or opinion}. Indeed I might extend it further

v. Perhaps it ought not to be said that
Theories should be universally rejected —

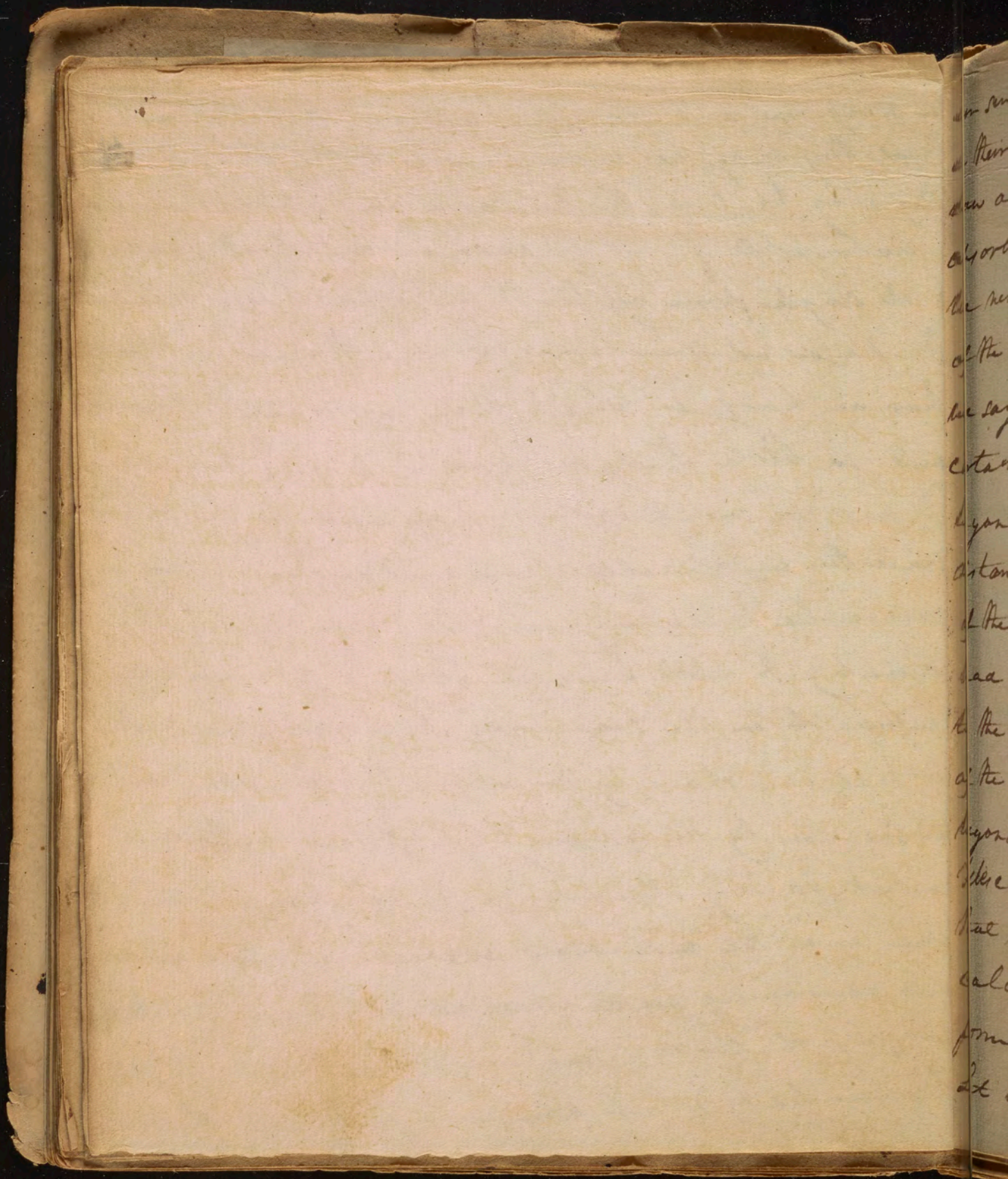
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and say that it is the only mode where
the senses do not serve us, of obtaining
knowledge of nature whether physical or
moral. The mathematical process is called
reasoning. but any one who will analyse
it will find that it is only a connected
series of observations -

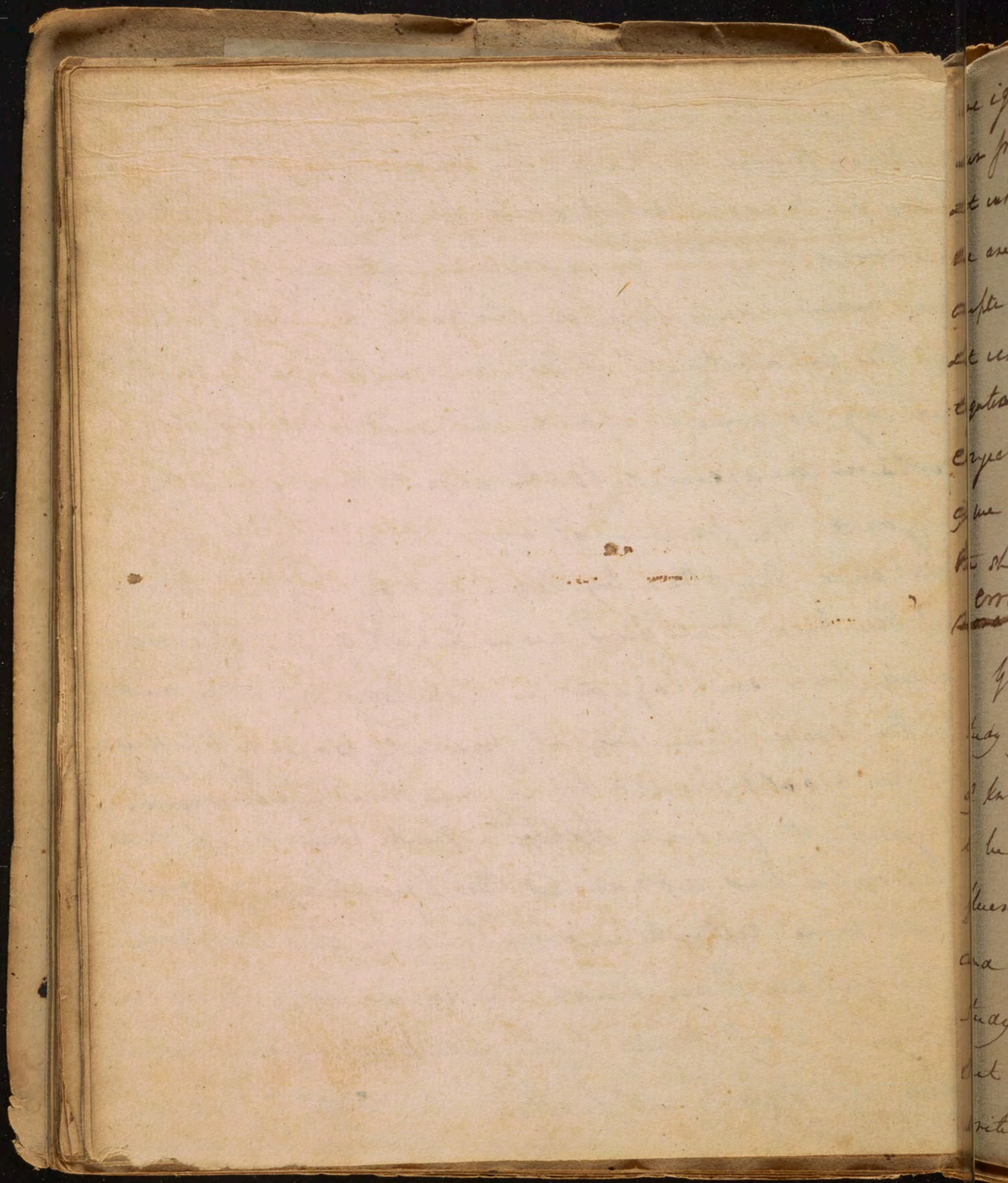
There is another exercise of the mind which ^{is} arran-
ged under the head of reasoning but which does
not belong to ^{the} order of that reasoning which is to
be employed for the attainment of truth. I mean
the theorizing that forms the greater part of
all medical inquiry. Theories are generally
founded on ^{or corroborated by} suppositions. From these premises the
reasoning is mainly consistent and correct, and
perhaps the best examples of deep and logical
thought are to be found in the theories that have
amused the world. The error is only in the
outset. ~~I will not say that theories are to be~~
~~rejected~~ ^{sometimes} they may be true, and after observation
has ~~proved~~ ^{proved} them to be so. But as truth

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is uniform, and error multiform. The chance²⁹
that they may be erroneous is to the chance ~~that~~
they may be true, in the same proportion that the
innumerable forms of error on a subject bear
to its single form of truth. Theorists have cranded
the pages of medicine, because there is in the
human body so much that we want to know
and so little that we can know. We feel ashamed
to meet the world with the confession of ignorance
since this unfortunately is considered as great a sin in
science, as the commission of any vice against
morality. In both cases we attempt to obviate
reproach in the same way. In morality we seek
to hide our shame by the artifices of denial, and
in science by the cunning bye of theory. But if
we seek for any other remedy for ignorance than
time and the industrious exercise of observation
and reasoning we deceive ourselves and stop the
progress of truth. There are some things in the
human body which can never be known, whilst



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our senses, the only testimony of truth, remain
in their present state. We shall never know
how a muscle contracts how a lymphatic
absorbs, how the nerves move, till we see them
we never conjecture or dispute about the form
of the inhabitants of the Moon, then why should
we say so much about the modus operandi of
certain medicines. Both objects are equally
beyond the power of our senses, the one by
distance the other by diminution. If one tenth
of the time that has been wasted in Theory
had been employed in inventing greater aids
to the senses than we at present possess the science
of the world would have been much ^{extended} ~~advanced~~
beyond its present ^{limits} ~~station~~. Think how much the
Telescope has advanced the knowledge of objects
that were distant and unknown and we can
calculate how much the microscope may in-
form us of those that are minute and unknown.
Let us then not hesitate to confess that we



are ignorant of those things which with ³¹
our present powers we ~~ought to~~ ^{cannot} know.
Let us exercise our minds on those things
we are capable of ascertaining, and they are
ample enough for the longest life of labour.
Let us seek to improve our senses for the inves-
tigation ^{of what} we do not know and by ceasing to
conjecture when we are not certain, let us try
if we cannot reverse that rule which makes
the shame of ~~error~~ ^{ignorance} ~~greater~~ ^{greater} than the shame of ~~error~~
~~error~~ ^{error} in

You will receive ^{some} ~~much~~ advantage in the
study of medicine by the cultivation of other branches
of knowledge, which at first sight do not seem
to be connected with it. There are remote in-
fluences in sciences as well as in ^{the} ~~world~~ ^{world} ~~physically~~
and among these ~~are~~ ^{is} the influence that the
study of one branch has on all others. I once
met with a sentiment in a distinguished
writer and advocate for literature, that some

• The profound general reasonings
of Hume. —

The extensive and secret operation of Moral
 causes, he would not say a Chinese Menda-
 rin was not a better Man because Milton
 had written his Paradise Lost. The sentiment
 is ~~an~~ extravagant, but it contains as much in
 the astute opinion does, some foundation, and
 the analogy of the extensive physical effects
 that often arise from apparently small causes
 warns us to be cautious in limiting its truth.
 With a similar view to the indirect influences
 of studies upon our mind, I believe that ^{all} other
 things being equal he will be a better physician
 who ^{has received the mental benefit of studying} ~~is acquainted with~~ Smith, Macaulay, & Na-
 tions, ~~the philosophical truths of Bacon~~
 and Shakespeare's plays. - I know gentle
 men ~~that~~ this is not a popular doctrine
 Physicians are often chosen because they
 are nothing but Physicians. Strange! that
 we should be allowed to join with our
 profession the ^{sordid and vulgar} art of making our fortunes
 and not the ^{rare and noble} art of making our minds

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These studies are beneficial in two ways. —
First. They furnish facts that may find a place
 in the comprehensive range which medical
 science takes. Consult the observations of the best
 medical authors and you will find they have been
 drawn from all departments of human know-
 ledge. Custom has connected the studies of
 Botany and Natural history with the educa-
 tion of a Physician, when in reality they have not
 more relation to it, than many other branches
 that never enter into College instruction. It is
 true they both throw light by analogy on
 human physiology. But the same thing is done
 by the higher departments of Poetry which
 gives the philosophy of character, and by the
 civil and political histories of the world. ~~They~~ which
 describe the happiness and turbulence of men
 they both instruct us in the healthy and dis-
 eased actions of his mind and passions.
 If medical education were to receive its full
 complement of aid from other knowledge, no one

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branch would be omitted. But the term of ³⁴ life and the limitation of intellect must prevent this. To a certain extent however it is practicable. We know that all science has two departments one consisting of the general principles, and the other the Detail. To learn the detail is the business of a life, and must be confined to the professional man. But the general principles are more easily obtained and may form part of the knowledge of every industrious student. It is a happy adaptation of the nature of knowledge to our finite capacities, that as our necessities confine us to the detail of one pursuit in science, we have yet an opportunity to gain an acquaintance with others thro' their general principles. I therefore say study your own profession thoroughly and in detail and make yourself acquainted with the general principles of as many others, as your situation will allow. But Secondly an advantage will not only be received in the facts furnished by other branches

For a genius for a particular pursuit -

For wants time only to make it -

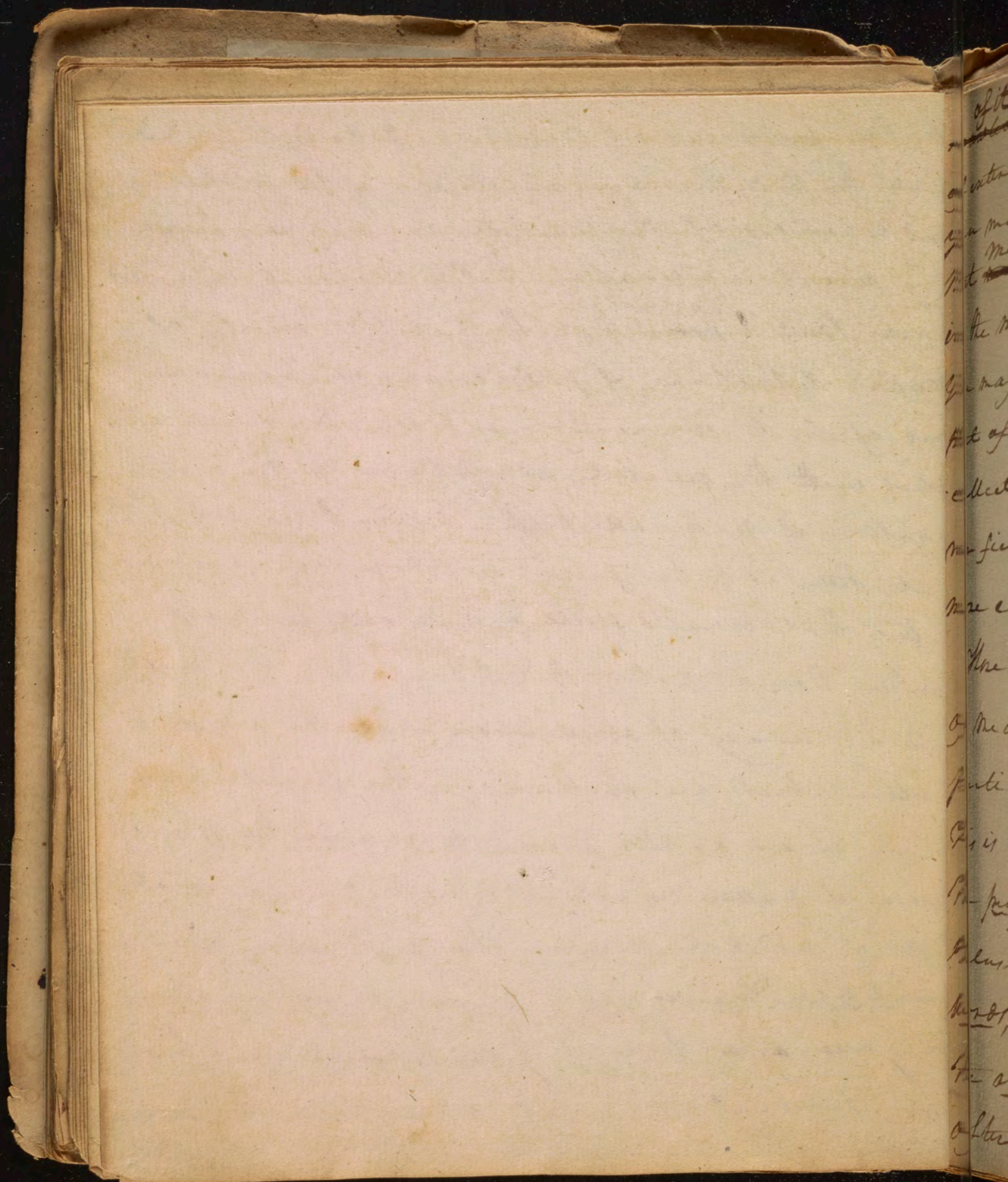
For intellect is but the mirror of nature, and cultivation of knowledge, but our mode of holding the reflection - Therefore we make mind by knowledge & knowledge by mind

of Sciences. A greater benefit will be derived 35
from the improvement your mind will receive
in the pursuit of them. The process of the mind in
the acquisition of all kinds of knowledge is the
same. The same instruments Perception, Memory, asso-
ciation and judgment ^{are} ~~is~~ employed in all sciences.
By the employment of these instruments in one
we acquire a more dextrous management of them
for others. 'Tis true some ~~of~~ branches are more easily
attained than others; and ~~we~~ we sometimes observe
~~these~~ ^a limitation of intellect which is called a pe-
culiarity of talent ^{but we ought to} ~~we~~ ^{this limitation} consider ~~it~~ rather
as a sublimity of ^{the} mental powers which have a
dominion over only a part of nature. A real
Master mind ^{is} capable of every thing. Since then
a finished intellect is fit for enterprise in all de-
partments. we should try by a kind of inverse
operation to produce a finished intellect by the
cultivation, as far as is practicable of every
department. To apply this ~~principle~~ principle re-

v. The successive steps of knowledge are made upon a multiplying ratio -

K.
H.

to the purposes of medicine. I do not see 36
that the mathematical studies of the properties
and relations of Magnitude and Number, have
any direct application to the treatment of a dis-
ease. But I ~~know~~^{am convinced} that the habit it creates of
precise definition, of judicious comparisons,
and of strict connection and conclusion, is ap-
plied with the greatest advantage to the in-
vestigation of medical truth. Again I do not know
that there is to be found in Thomson's Seasons
a line that would serve a medical purpose
further than a motto. But I know that the nicety
and accuracy of observation of all the objects of
nature which are embraced by the subject, may
create in us a like power to observe the pheno-
mena of nature as exhibited in the immediate ob-
jects of medical science. The cultivation of other
knowledge besides your proper profession should
be your aim then if you have placed high
your hopes of medical distinction. The more



37
~~Knowledge~~ ^{of it} is gained the more is the capacity
of extending it increased. and tho' a survey of what
you may thus accomplish, may discover some ^{branch}
that ~~may~~ remain unless it has rendered us benefit
in the mental exercise by which it was obtained.
You may deplore your time as lost because the
fruit of it is not immediately produced, but re-
collect it is like the loss in the fallow of a sum-
mer field, which renders succeeding cultivation
more easy and ^{productive} successful. -

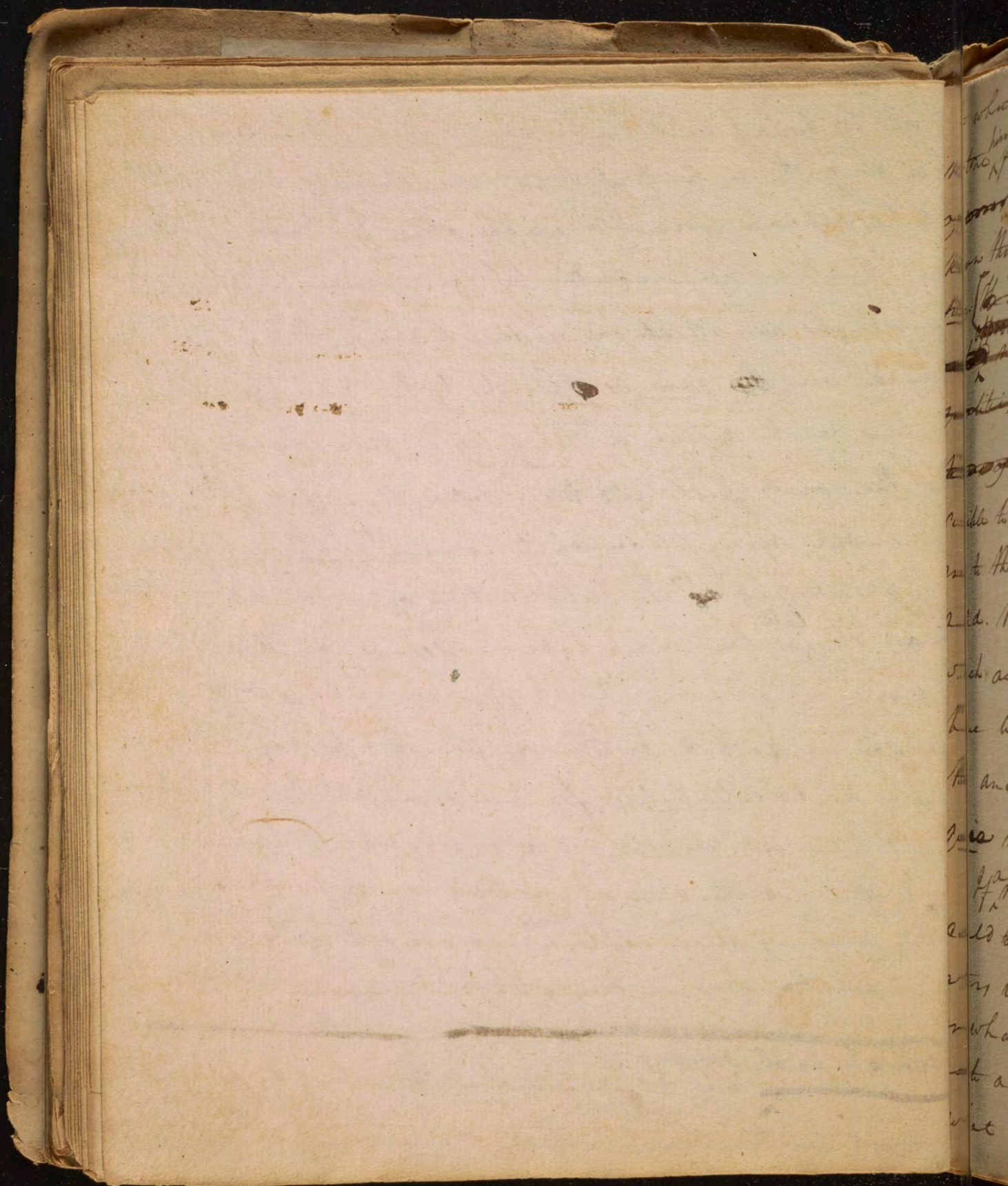
There is an evil which mars the investigation
of Medical Science against which we must
particularly guard. I mean Prejudice -
This is a mental deception and is of two kinds
the prejudice of words and judgement. Every
Philosopher complains of the obstruction that
words, or if the evil be not repeated to them,
the abuse of words offers to the inquiry
after truth. - words are an injury and

v. in our enquiry after truth by -

v. The proposition is then reduced to this

First by being metaphoricals, then by 38
leading to a belief that two things are entirely
alike, which resemble each other perhaps in but
one particular. Secondly by giving rise to abstraction
by which our attention is directed from things and
fixed on ~~the~~ sounds. Thirdly by the attempt which
is made to define a thing by a few words. Where
as, the only just and true definition of a thing is
the entire description of it. and Fourthly by our
being satisfied ^{by} the substitution of a word for an
idea. This ^{is} the most copious source of ^{the} deception
of words in medicine. I will give an example of it.

We say we do not restore a drowned person because
there is no excitability for our remedies to act upon.
This satisfies our enquirer, but excitability is here only a
word, it is not the sign of any thing our senses know, which
is the meaning of an idea, ^{so} we do not restore him because
there is not that thing in him, by which he may be restored
~~which we observe in excitability, and there is the same~~
^{which is only saying}
~~things as to say we~~ do not restore him because we
cannot restore him. so that the whole is reduced



to what Philosophy^{hers} should only say. we cannot ³⁹
instone^{him} for this is a truth. — There are the deceptions
of ~~words~~ language that we must avoid if we wish to
know things as they are, which is the aim of true Philoso-
phy. ~~The reason for saying that by giving a man~~
~~names we are often blinded to some estimable~~
~~qualities he may perhaps apply by analogy to the~~
~~kind of things,~~ } By these ^{delusions} we are often ~~made~~ made in-
sensible to the differences of things that words have joined,
and to the resemblance of things that words have sepa-
rated. Many instances are not wanting in science, in
which our ideas have been misled by words that
have been given by the rule of contrarieties, as
the ancients gave the names to the Asterisks "Parece-
que non Parebant"

If men were only to observe and think, and
could ~~they~~ ^{they} at the same time receive the knowledge of
others without the communication of language
or what would be the same, could he live so long
as to acquire by his single observation and thinking
what he demands of others, for the want of time,

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There is no calculating how much sooner he 40
would arrive at the point of knowledge allotted to
man, than would be reached by any number of
men magnifying by the imperfect and fallacious
aid of words. Perhaps I may be considered as
facetious, and I utter it only as a fancy when I
say that brutes on this principle do perhaps more
accurate knowledge of the objects that come before
their senses, by observing them themselves, than if the same
knowledge had been derived by a language, from
their species. - May I ask too if some of those acute
perceptions and conclusions which we call their
instincts are not the effect of the dumb study they make
of the objects that concern them. - A sect of ancient
Philosophers enjoined the keeping a term of si-
lence on their novices, an Institution worthy
the wisdom of Pythagoras, which limiting they
employment to observing and recording, gave
them juster notions of the realities of things.
But - A greater evil is done to science, by the pre-
-judice of magnum. By prejudice in judgment

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r. ~~Case~~ it with all our pride -

I do not mean belief without ~~satisfactory~~ 41
~~reason~~ sufficient argument. since this is a re-
lative and a variable thing. as no one ever be-
lieved a thing without satisfactory reason to
himself. By prejudice I mean opinion formed
without appropriate ~~reason~~ argument. Thus
if I reject an enemies opinion because he ~~has~~
^{injured me} ~~expressed~~ it is using an unappropriate argument.
since my feeling the injury has no more connection
with his opinion than it has with the language
he speaks. we are accused into supposing them
related by both of them attaching to the same
person. - ~~The principle of the wrong~~ - we are how-
ever not only to guard against the prejudices
we have from envy or dislike towards
others. But we must carefully to avoid a larger
clap that results from a love of ourselves, when
we have adopted an opinion, we consider
it as part of ourselves, and we ~~identify it~~
~~substantially with it, that it is ours, that it~~

is this made of ~~reasoned~~ reasoning

~~and the only of our friends and great men~~ 42

~~and the only of our friends and great men~~

This partiality for our opinion is a prejudice - It is an unappropriate argument, it is liking our opinion because we like ourselves. But however false ^{may} ~~may~~ be, I ^{think} ~~may~~ ^{may} say a part that it has ^{been} ~~used~~ ^{used} as the support of more opinion in the world than any other argument, even the testimony of a sense. This self-love should be no argument to a Philosopher. He should be ready to give up not only his opinion but the great master of wisdom Socrates, set the example that he should resign his life also for the sake of Truth. Let us consider Truth a Tyrant and give her all she demands. - It is ~~as~~ told as characteristic of Jacob ^{himself} ~~himself~~ the a Scottish thief once ordered a retainer who had offended him to destroy himself. In the midst of his situation his wife addressed him. "Go away John and hang your self, and do not displease the Laird. In like manner a Philosopher should consider

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himself the abject slave of Truth, and 43
should be ready to lay down ^{even} a pinion, which
is often valued more than life, but he displease
her. — The world as well as individuals has
suffered from the association of certain things
which have no necessary connection. The Poli-
tician has his honesty ^{improperly} ~~too~~ associated with his
party. Religious creed is associated with Morality
and professional opinion with Skill. And it is
because these three great points of pride in
man his honesty his Morality and his Skill, are
supposed to be affected in the question of his
^{mere} opinions, that he meets with such eagerness and
obstinacy every ~~other~~ slight upon them. But it is
time for philosophy to dissolve all connections
that impede the progress of Truth. —

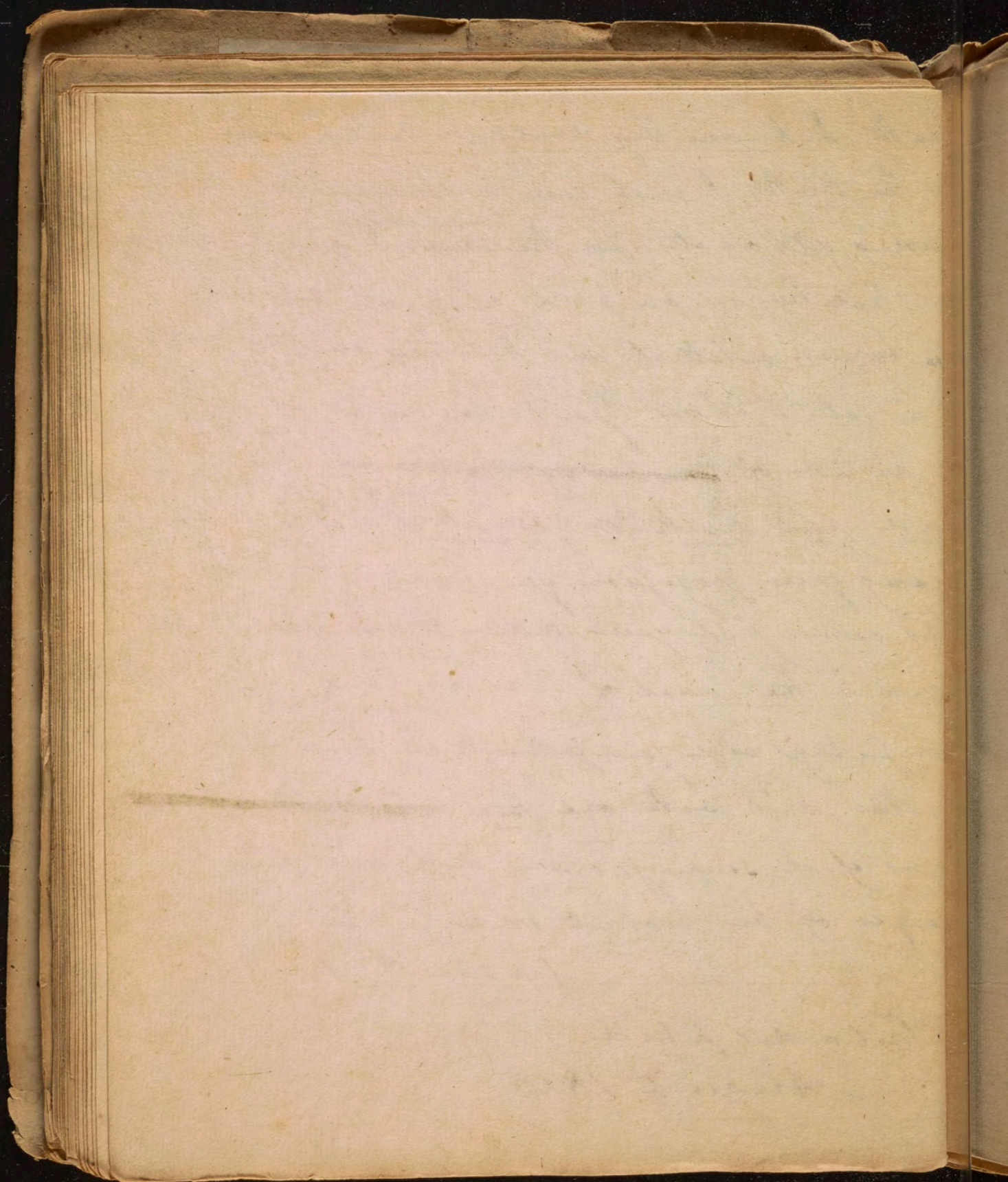
In viewing the lectures I will read to you, I
hope we may be governed by the principles I
am inculcating. I believe they contain much

v. These lectures used to address his
pupils —

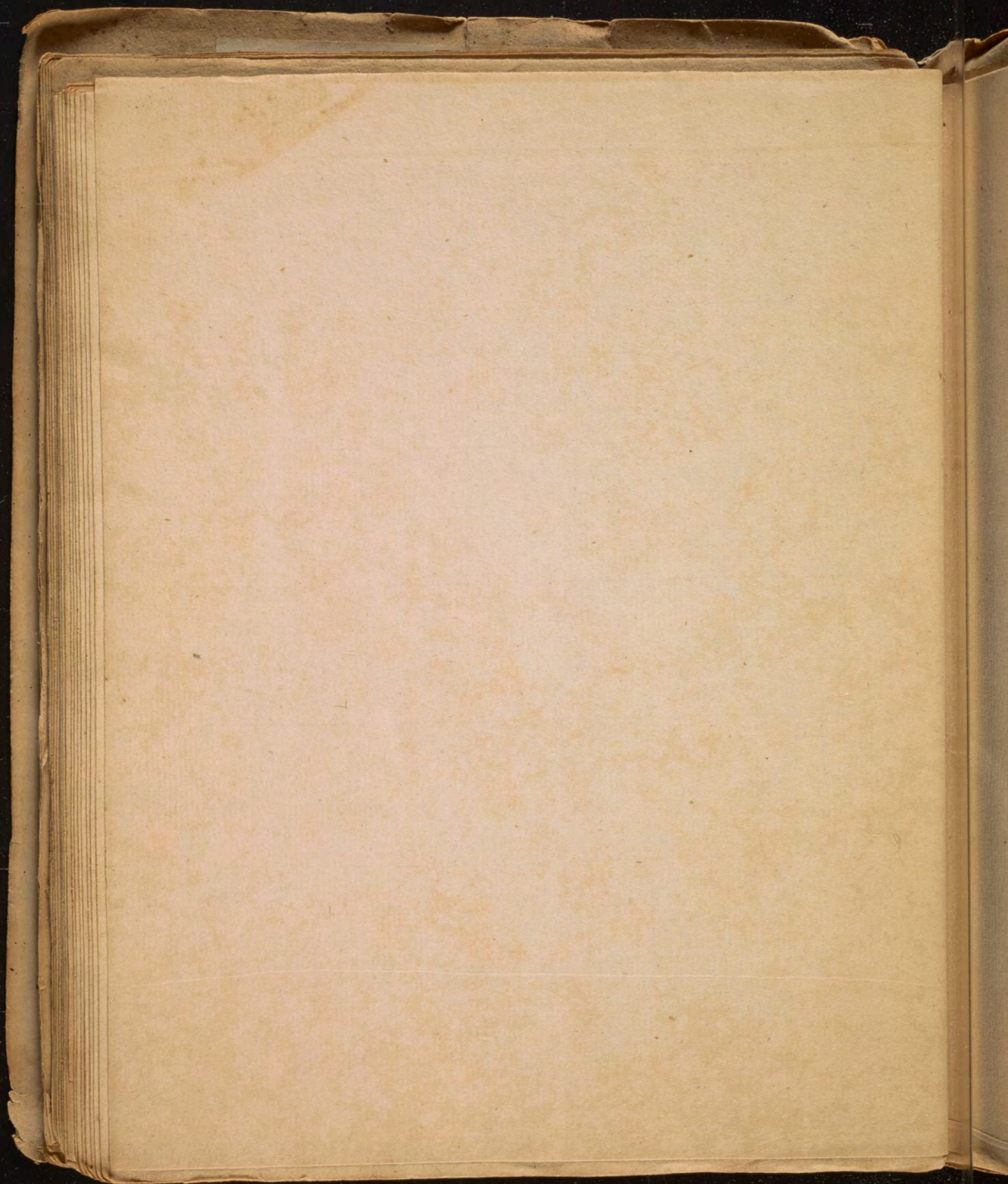
truth. I know they contain much ^{speculation} ~~much~~ 44
For the truth I wish you to consider me the per-
suading advocate. For the ^{speculations} ~~errors~~ I give no apology
but that they are on points of great difficulty to
~~man~~ human intellect, and that they are the work
of a fallible man. You know the words in which
the author of ~~the book~~ ^{addressed you}. "Observe
Read and Think for yourselves" If then in
choosing your profession, you have determined, be-
sides aiming at your individual benefit, to
advance the cause of Science. Come let us use
our feelings and judgement on these lectures
together, and with one pen ~~and hand~~ ~~that~~
let us if it seem proper blot out whole
pages of his honest error. —

James Rush
Philadelphia

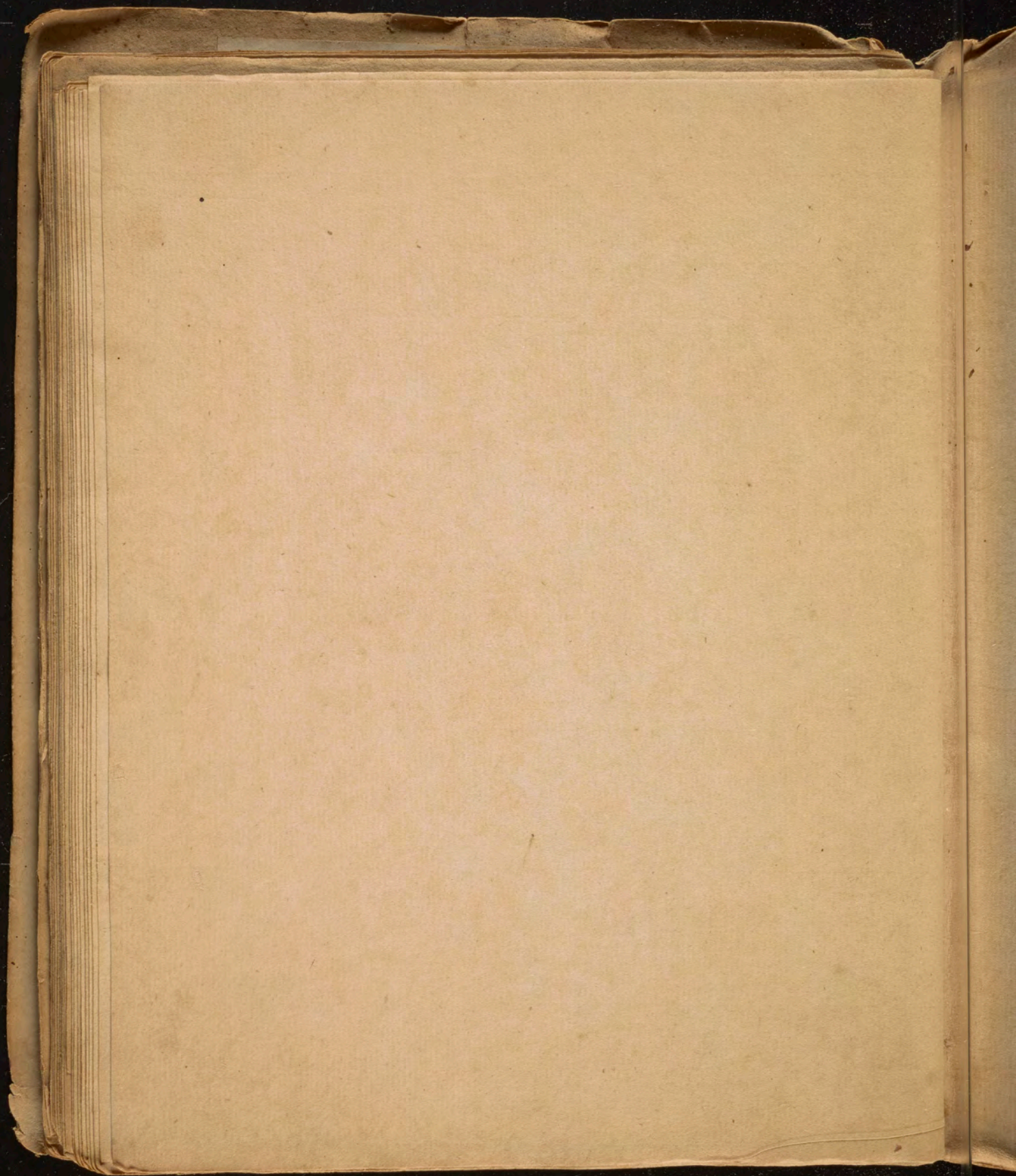
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